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With the author's Rega

*Descriptions of new Fishes, collected by Dr. A. L. Heermann, Naturalist attached to the Survey of the Pacific Railroad Route, under Lieut. R. S. Williamson, U. S. A.*

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#### PERCIDÆ.

1. *CENTRARCHUS INTERRUPTUS*, G.—General form rather elongated; very much compressed. Nuchal region swollen; oculo-cephalic region subconcave. Snout tapering; lower jaw longest. Posterior extremity of upper maxillary reaching a vertical line drawn back of the pupil. Head forming a little less than the third of total length. Eyes large and circular; their diameter being comprised four times in the length of side of the head. Scales on cheeks rather small; a little larger on the opercle than on the cheek.

D XIII. 11. A VII. 10. C 5. 1. 8. 7. 1. 4. V I. 5. P 13.

The origin of the spiny dorsal is situated opposite the base of the pectorals, and the origin of the anal, opposite the space between the eleventh and twelfth dorsal spines. The tip of rays, as well as the base of anal, extends a little farther back than the dorsal. The base of ventrals falls upon the same vertical line as that which would intersect the base of pectorals. Scales of medium size; minutely serrated.

Greyish brown above, silver grey beneath. Irregular transverse bands of dark brown or black, interrupted along the lateral line, the portion of the band above it is somewhat alternating with the portion beneath it. A large black spot may be seen at the upper angle of opercle.

Specimens from Sacramento River, Cal.

#### COTTIDÆ s. CATAPHRACTI.

2. *COTTOPSIS GULOSUS*, G.—Largest specimens a little over three inches in total length; of which the head forms the third, the caudal fin excepted. Preopercle provided with two small spines, such as may be observed in several species of *Cottus* proper, the head otherwise is smooth; mouth proportionately large; posterior extremity of upper maxillary reaching a vertical line, which would pass behind the pupil. A space of five twentieths of an inch exists between the

origin of the first dorsal and the occiput. Second dorsal connected with the first by a low membrane proceeding from the last spiny ray. Tips of posterior soft rays not quite reaching the base of caudal. Anal, about as high as second dorsal, but shorter. Caudal, well developed and posteriorly rounded. Origin of ventrals midway between the tip of lower jaw and the anus. Pectorals broad and large, its longest rays extending posteriorly as far as the fifth ray of second dorsal.

D IX. 18. A 13. C 3. 1. 5. 4. 1. 2. VI. 4. P 15.

Lateral line uninterrupted from thoracic region to base of caudal. Abdomen beset with minute prickles; skin elsewhere smooth.

Ground color reddish brown; head and dorsal region spotted with black. Dorsals, caudal and pectorals barred with blackish; first dorsal provided posteriorly with an elongated black spot. Anal and ventrals unicolor.

Inhabit San Joaquin River, Cal.

#### Genus ASPICOTTUS, Girard.

Head covered with bony plates. Opercular apparatus armed with strong spines. Mouth moderately cleft; jaw equal. Teeth on the maxillaries and front of vomer; none on the palatines. Gill openings separated by an isthmus; branchiostegal rays six in number. Dorsals distinct; first, rather small and lower than the second. Caudal rounded posteriorly. Pectorals broad and large. Insertion of ventrals under the base of pectorals. A series of bony scutellæ running along the sides of back from head to tail. Skin otherwise smooth.

*Obs.*—To this genus must be referred *Cottus bubalis* of Euphrasen, from the Baltic and Norwegian seas.

3. ASPICOTTUS BISON, G.—Greatest length seven inches and a half. Head broad and large, forming a little less than the third of the whole length. Body tapering rapidly backwards. Orbits raised above the surface of the skull, which exhibits a parieto-occipital carina. Above and inwardly of nostrils a rough plate is observable. Preopercle provided with four spines, uppermost very long, extending backwards to the posterior edge of opercle; the two next ones are small and directed obliquely downwards; the fourth, may be seen at the lower edge of that bone and directed obliquely forwards. The opercle has three spines; a stout one along the upper margin of that bone, and two small ones towards its inferior margin and directed obliquely downwards. The posterior extremity of interopercle, finally exhibits the last and smallest spine of the opercular apparatus. The isthmus is rather large. The first dorsal begins at a very short distance from the occiput, and is separated from the second by a similar small space. Its base is contained once and a half in that of the second dorsal, the posterior rays of which, do not reach the base of the caudal. The caudal in itself is rather long. The origin of the anal is under the fourth ray of second dorsal; the tips of its posterior rays are almost even with those of the last mentioned fin, although its base does not extend as far behind. The ventrals are long and slender; their insertion being nearly equidistant between the symphysis of lower jaw and the vent. The tips of pectorals reach a vertical line, which would intersect the second ray of second dorsal fin.

D VIII. 12. A 9. C 4. 1. 5. 4. 1. 5. VI. 3. P 16.

The lateral line appears to be occupied by a row of oblong bony plates, from thirty to thirty-three in number, and extending from head to base of caudal in diminishing gradually backwards.

Color dark brown above, mottled with black; fins (except ventrals) yellow and black. Beneath dull yellowish with brownish meandric lines under the head and throat; ventrals whitish.

From San Francisco, Cal.

#### Genus LEPTOCOTTUS, Girard.

General form of body and head elongated. Head smooth, with several spines on the preopercle. Mouth deeply cleft; upper jaw longer than the lower one. Teeth upon the maxillaries, front of vomer, and palatines. Gill openings



separated by an isthmus; branchiostegal rays, six in number. Dorsals separated by a narrow space; first, rather short, and lower than the second. Caudal subtruncated. Pectorals broad and large. Insertion of ventrals under the base of pectorals. Skin smooth as in *Scorpenichthys*. Lateral line continuous for the whole length of the body.

4. *LEPTOCOTTUS ARMATUS*, G.—Greatest length of specimens observed, about ten inches. Head forming more than the third of that length, caudal fin included. Surface of head and snout spineless. The only spines observable are situated on the preopercle; a very stout one terminated by three conical processi directed upwards and forwards, and a small, blunt one beneath directed downwards. The origin of the first dorsal is situated in a line with the posterior cutaneous flap of the opercle and upper edge of insertion of the pectorals; its base is about half that of the second dorsal. The caudal is subtruncated. The anal is much lower than the second dorsal and not quite as long. The insertion of ventrals is beneath the pectorals and nearer to the snout than to the vent. The tips of pectorals extend to a line corresponding to the anterior ray of second dorsal, which is in advance of the vent.

D VII. 17. A 16. C 6. 1. 5. 4. 1. 7. V I. 4. P 19.

Ground color above blackish brown; whitish beneath. Dorsals, caudal and pectorals, yellowish, barred with black; anterior dorsal with a black spot posteriorly. Ventrals and anal whitish.

From San Francisco, Cal.

#### Genus *SCORPÆNICHTHYS*, Girard.

Head partly covered with bony plates, without, however, any rough appearance. A few small spines on the opercular apparatus. Mouth deeply cleft. Jaws equal. Teeth on the maxillaries, front of vomer, and on the palatines. Gill openings continuous; branchiostegal rays, six in number. Dorsals distinct though contiguous; first rather long and of the same height as the second. Caudal truncated. Pectorals broad and large. Ventrals inserted back of the base of pectorals. Skin smooth, without either scales or plates; lateral line distinct and continuous the whole length of the body.

5. *SCORPÆNICHTHYS MARMORATUS*, G.—A large species, of which several specimens were procured. The head forms the third of the length, the caudal fin excluded. A rather small and blunt spine is situated above and inwardly of the anterior nostril. The snout is rounded and gradually sloping anteriorly. The posterior extremity of the upper maxillary extends a little beyond the posterior rim of the eye. The preopercle is armed with two small spines only, and occasionally with the rudiments of a third. The other pieces of the opercular apparatus are spineless. A cutaneous, branching flap, similar to those of *Scorpana*, is observable above the posterior rim of the orbit. The first dorsal begins immediately behind the occiput, with a base almost as long as the head, being composed of eleven rays, the last sending its membrane to the anterior ray of the second dorsal, which is one-fifth of its length longer than the anterior one. The anal is but little shorter than the anterior dorsal. The insertion of ventrals is a little nearer to the anal than to the tip of lower jaw, and are composed of five soft rays and a spine. The pectorals, composed of sixteen rays, are large and broadly developed, extending posteriorly beyond the tip of ventrals, reaching a vertical line drawn from the separation of the dorsals to the vent.

D XI. 19. A 13. C 6. 1. 5. 4. 1. 5. V I. 5. P 16.

Ground color of body light-yellow or dark-brown; fins yellowish; both body and fins marmorated with large, black patches.

From San Francisco, Cal.

#### *SCORPÆNIDÆ* s. *CATAPHRACTI*.

6. *SEBASTES AURICULATUS*, G.—This species is allied to *S. inermis* of the Japanese seas, in the structure of the upper surface of the head; the spines of which instead of being raised are reduced to horizontal ridges, terminating pos-

teriorly in acute points; membranous flaps are likewise wanting. The diameter of eye is contained four times in the length of side of the head. The posterior extremity of upper maxillary projecting a little beyond the posterior rim of the orbit.

D XIII. 14. A III. 7. C 4. 1. 6. 5. 1. 3. V I. 5. P 18.

The tip of pectorals when directed backwards extends to a vertical line which would intersect the anus. The first dorsal is composed of twelve spines; a thirteenth is situated at the anterior margin of the soft dorsal.

Color, reddish brown above and on the sides, becoming brighter towards the abdomen. The upper parts clouded with blackish. A large black spot covers the upper half of the opercle.

From San Francisco, Cal.

#### HETEROLEPIDÆ s. CATAPHRACTI.

We propose forming under the above name a new ichthyic group of the well known genus *Chirus*, and a new one described below under the name of *Ophiodon*.

The natural characters by which this group or family is distinguished are: a body elongated, compressed and tapering; covered with rather small scales. Two long dorsal fins occupying almost the whole of the dorsal region. Ventrals situated under the pectorals. Canine teeth upon the jaws, canine or velvet-like ones on the vomer and palatines. Preopercle and opercle either smooth or provided with spines. The posterior suborbital sends a narrow arcade to the limb of the preopercle as in the *Cottoids* properly so called; that bony arcade being concealed under the flesh, skin and scales constituting the cheeks.

#### CHIRUS, Steller.

This Genus we shall, for the present, characterise as follows: a superciliary, membranous arborescent flap. Mouth of medium size; canine teeth on both jaws; velvet teeth on the front of vomer and palatines. Preopercle and opercle without any spines. Cheek, opercular apparatus, and top of head, covered with small scales. Gill openings continuous and not separated under the throat. Branchiostegal rays six in number. Scales finely serrated posteriorly. Several lateral lines.

7. *CHIRUS PICTUS*, G.—About twelve inches in total length, in which the head is contained four and a half times. Eyes elliptical, longest diameter contained five times in the length of side of the head. Dorsals contiguous at their base only. Origin of anterior dorsal opposite the posterior flap of opercle. Anal as long as the second dorsal; membrane uniting the rays deeply indented. Caudal posteriorly sub-convex.

D XIX. 23. A 21. C 4. 1. 7. 6. 1. 6. V I. 5. P 19.

Scales of medium size provided with but very few serratures upon their posterior margin. Minute scales on the head, cheeks, opercular apparatus and base of fins. Ground color dark brown. Large and numerous vermilion spots, bordered with black, on the sides and inferior fins. Ground color of belly, dull whitish or yellowish.

From San Francisco, Cal.

8. *CHIRUS GUTTATUS*, G.—Closely allied to the preceding, from which it is distinguished by a larger eye and broader scales, the posterior margin of which is much more serrated, so as to be much rougher to the touch. The origin of first dorsal is situated in advance of the posterior flap of opercle. The superciliary flap is much less developed. The caudal is subconcave posteriorly.

D XXI. 25. A 24. C 5. 1. 7. 6. 1. 6. V I. 5. P 19.

Ground color greyish yellow; upper part of head and sides of body with crowded small blackish spots extending to the pectorals, caudal and dorsals. Beneath unicolor and lighter. Ventrals and anal blackish.

From San Francisco, Cal.



The second Genus of this group, for which the name of

OPHIODON, Girard,

is proposed, has a more elongated head than the preceding one. Its mouth is deeply cleft; canine teeth exist on both jaws, rather more developed than in *Chirus*. The vomer is possessed with similar teeth as well as the palatines, where they form a very long series. Posterior convexity of preopercle provided with small spines. Minute scattered scales on the head, cheeks and opercular apparatus. Branchial apertures continuous; branchiostegal rays six in number, scales very small.

9. *OPHIODON ELONGATUS*, G.—Largest specimen observed, twelve inches long, the head forming about one fourth of that length; the greatest depth, measured at the origin of the trunk enters seven times in the total length. The thickness is one third less than the depth. The body is gradually diminishing backwards, both in height and depth. The upper surface of the skull is slightly concave. Eyes, subcircular and quite large, their horizontal diameter being comprised five times in the length of side of the head. The posterior extremity of the upper maxillary extends beyond the posterior rim of the orbit. The anterior suborbital overlaps the upper maxillary. Six or more small spines may be observed upon the posterior curve of preopercle. The upper angle of opercle terminates in an acute process. The subopercle is very long and stretches considerably beyond the opercle. The origin of the first dorsal is situated in advance of the spiny limb of the preopercle, at a distance of four tenths of an inch from the occiput; it is contiguous to the second dorsal, which terminates at an inch and three tenths from the base of caudal (not from its rudimentary rays). The anal is nearly the same length with the second dorsal. The tips of pectoral extend beyond the tip of ventrals.

D XXVI. 22. A 23. C 7. 1. 5. 6. 1. 6. V I. 6. P 17.

The scales are small, elongated, smooth and entire upon their anterior margin. They extend somewhat over the base of the fins.

The color is very imperfectly preserved; upon a dull yellowish ground may be seen, on the upper part of the body, dark or blackish brown spots irregularly scattered; the head appears uniform blackish brown. Beneath dull whitish yellow; scales silvery. Fins greenish yellow; ventrals and anal unicolor; rest exhibiting greyish spots.

From San Francisco, Cal.

GASTEROSTEIDÆ s. CATAPHRACTI.

10. *GASTEROSTEUS WILLIAMSONI*, G.—General form elongated, of rather slender appearance; body tapering gradually towards the base of caudal. Greatest length an inch and three quarters; head forming the third of it—caudal fin excluded—and covered with long plates so finely granulated as to appear smooth. Body perfectly smooth from head to tail. Two small dorsal spines; a third very minute one at the origin of the soft dorsal fin. Ventral spines quite small, exhibiting but few and very minute spiculæ upon its upper margin. Caudal posteriorly subconcave. Anterior spiny ray of anal very small.

D I. I. I. 11. A 1. 7. C 3. 1. 5. 5. 1. 3. V I. 1. P 10.

Color, above greyish brown, spotted; beneath of a soiled yellowish or whitish.

Specimens were collected at Williamson's Pass, Cal. The basin into which the waters in which they were caught flow, is not yet determined.

11. *GASTEROSTEUS MICROCEPHALUS*, G.—The head is very small, plated, and apparently smooth, although finely granulated. The body is quite deep upon its middle region, tapering towards both extremities; a little more rapidly posteriorly. The peduncle of tail is very short and contracted. Greatest length about an inch and a half, of which the head forms the fourth part. Anterior part of body from head to second dorsal spine, plated; remaining portion smooth. Two acute and well developed dorsal spines; a third one, and rather small, is

situated at the origin of the soft dorsal. A still smaller spine precedes the anal. Ventral spines very much developed, and serrated upon both edges, more minutely, however, below than above. Caudal posteriorly subcrenate. Pectorals rounded posteriorly.

D I. 1. 1. 9. A 1. 6. C 2. 1. 5. 5. 1. 1. V I. 1. P 10.

Ground color yellowish brown, spotted or else transversely banded with greyish black; the spots or bands being formed of crowded dots. Beneath, dull yellow, occasionally dotted. Specimens collected in Four creek, a tributary of Tule lake (San Joaquin Valley), Cal.

### [ATHERINIDÆ.

#### Genus ATERINOPSIS, Girard.

This genus is intended to include such species of *Atherina*, in which the palate is unprovided with teeth, having besides a mugiloid fashioned mouth; the intermaxillaries constitute its upper arcade, exclusive of the maxillaries, which are situated behind.

12. ATERINOPSIS CALIFORNIENSIS, G.—Specimens measuring seven inches and a half in total length were observed; the head forming exactly the sixth part of it. The body is very compressed, slender and very graceful. The caudal fin is deeply forked; the base of anal is equal to the length of head; the base of second dorsal is scarcely half as long as that of anal. Insertion of ventrals equidistant between the tip of snout and posterior extremity of base of anal fin. Tip of pectorals not reaching the insertion of ventrals. Eye large and subcircular, nearer to the tip of snout of one of its diameter than to the posterior edge of opercle. The mouth is quite small. The head above is slightly convex.

D VI. 1. 10. A 1. 17. C 5. 1. 8. 7. 1. 7. V I. 5. P 13.

The scales are very large, constituting but thirteen distinct longitudinal rows upon the line of greatest depth of body. They are anteriorly rounded and posteriorly truncated, the margin of which, in the latter region, is ornamented by a series of tooth shaped serratures, more conspicuous upon large and somewhat dried specimens.

Greyish brown above, dull buff beneath the silvery band. Fins unicolor, dull yellowish or greyish. When the scales are removed the upper part of the body is reddish brown; the lower part lighter with a silvery reflection.

From San Francisco, Cal.

### GOBIDÆ.

13. GOBIUS GRACILIS, G.—About three inches and a quarter in length; the body is slender, compressed and tapering. The head, which partakes of the slender aspect of the body, forms about the fourth part of the whole length. The mouth is very large; its angles corresponding to a vertical line which would pass near the middle of the pupil. The eye is large and elliptical, situated near the summit of the head and its longitudinal diameter comprised a little more than four times in the length of side of head. The interocular space above measures a fifteenth of an inch. The dorsal and anal are rather long. The caudal is posteriorly rounded or else convex upon its margin. Insertion of ventrals in advance of anterior margin of first dorsal and behind those of pectorals.

D V. 17. A 13. C 4. 1. 6. 5. 1. 5. V 5. P 18.

Dull reddish brown; fins blackish.

From San Francisco, Cal.

### EMBIOTOCIDÆ.

14. EMBIOTOCA LINEATA, G.—Body elongated, regularly arched on both the dorsal and ventral lines from head to posterior extremities of base of dorsal and anal fins. In specimens eight inches and a half in total length, the head is found to constitute a little less than the fourth of that dimension: the greatest depth, taken upon the middle of abdomen, does not enter three times in the length. The mouth is small; the posterior extremity of upper maxillary not



extending to the anterior rim of orbit. Eye circular: its diameter entering four times in length of side of head. Origin of first dorsal opposite the middle of base of pectorals, its base being nearly equal to that of anal and a little shorter than that of second dorsal. Caudal forked.

D X. I. 24. A III. 30. C 3. 1. 6. 6. 1. 2. V I. 5. P 1. 21.

The scales are subquadrangular in shape, a little longer than high, provided anteriorly with from five to seven grooves.

Deep purplish brown above the lateral line, lighter beneath; sides of abdomen yellowish. Longitudinal light stripes between the rows of scales, more conspicuous below than above the lateral line. Dorsals, anal, caudal and ventrals purplish, base of anal exhibiting a whitish stripe. Pectorals whitish or yellowish.

From San Francisco, Cal.

15. *AMPHISTICHUS SIMILIS*, G.—Among the specimens collected, there is one—a female—a little over four inches and a half in length, which we propose to describe as a very closely allied species to *A. argenteus*. There are two prominent characters which will enable us to distinguish between both species: in *A. argenteus* the posterior extremity of upper maxillary extends beyond to a vertical line which would pass through the middle of the pupil, whilst in *A. similis* it scarcely reaches the anterior rim of the same organ. Again, in the former, the second and third spiny rays of the anal are much longer than in the latter. The number of rays of fins is nearly the same; the anal has three and the pectorals two more soft rays in *A. argenteus* than in *A. similis*. There are also eleven spiny rays to the anterior dorsal of *A. argenteus*.

D X. 24. A III. 25. C 2. 1. 6. 6. 1. 3. V I. 5. P 1. 24.

The head is contained three times in the length, the caudal fin excluded. The eye large and circular, enters less than four times in the length of side of head by its diameter. The greatest depth is to the greatest length, as one to three. The body is very much compressed. The insertion of ventrals is in a line with the third spine of anterior dorsal, which is also the line of greatest depth.

The coloration is not sufficiently preserved for comparative description.

From San Francisco, Cal.

16. *AMPHISTICHUS HEERMANNI*, G.—A specimen of this species, a little over eight inches and a half in length, in affording one character proper to *Holconotus* has left us for some time in doubt as to its generic affinities. We speak of the structure of the dorsals, the anterior of which is composed of spiny rays higher than the soft ones of the second. Indeed, there is a slight depression in the line limiting these fins, corresponding to their point of junction; but finding that such was also the case in *Holconotus*, that character could no longer be of any generic value. Seeing, however, that there were two rows of teeth on the lower jaw as well as on the upper, and that the lips, rather thin, were not free upon the symphysis of the lower jaw, we decided on placing it in the genus *Amphistichus* where it really belongs. The shape and size of the mouth are altogether similar to that observed in *A. argenteus* and *A. similis*.

The body is very much compressed, of a short appearance, the nape prominently arched, the head contained about four times in the total length and the greatest depth twice, the caudal fin excluded. Eye contained about four times in the length of side of head. The posterior extremity of upper maxillary hardly reaching the vertical of the anterior rim of pupil.

The number of rays of the fins is the same as in *A. argenteus*, with an exception in the first dorsal, which has ten spines, instead of eleven, as in *A. similis*.

D X. 24. A III. 28. C 3. 1. 6. 6. 1. 3. V I. 5. P 1. 26.

The color does not differ much from that of *A. argenteus*.

From San Francisco, Cal.

#### CIPRINIDÆ.

17. *GILA CONOCEPHALA*, B. and G.—There was but one specimen of this species collected, about seven inches and a half in length. General shape subfusiform, compressed; back slightly convex from nape to posterior margin of

dorsal fin. The head is subconical and contained exactly four times in the length, the caudal fin excluded. The mouth is comparatively large, although the posterior extremity of the intermaxillary does not quite extend to the anterior rim of the eye: the snout being prolonged, and the cleft of the mouth nearly horizontal. The eye is subcircular and its diameter contained five times and a half in the length of side of head. The anterior margin of the dorsal is nearer the end of snout than to the tip of central rays of caudal. The caudal itself is forked and participates of the slender appearance of the body. The origin of anal is situated behind the base of the dorsal, but at the same time in advance of the tip of the rays of the latter. The insertion of ventrals is situated in advance of the anterior margin of dorsal; their tip reaching the anus.

D II. 9. A II. 9. C 8. 1. 9. 8. 1. 9. V I. 9. P 16.

The scales are semicircular and of medium size. The lateral line forms an open curve along the sides, the convexity of which is downwards.

Upper regions of body and head brown; sides yellowish; abdomen whitish. From Rio San Joaquin, Cal.

#### Genus POGONICHTHYS, Girard.

Shape of mouth as in *Gila*; angle of mouth provided with a small filiform barbel. Body fusiform and compressed. Caudal forked. Insertion of ventrals behind anterior margin of dorsal. Scales large and uniform. Lateral line below middle of flanks.

This genus represents in the western waters of North America that of *Gobio*, to which it is intimately related.

18. POGONICHTHYS INEQUILOBUS, B. and G.—General form very regular, subfusiform and compressed. Total length of specimen described, about ten inches, of which the head forms a little less than the sixth part. The eye is subcircular; its diameter comprised about five times in the length of side of head. The mouth is of medium size; its cleft does not extend to a vertical line which would pass in advance of the orbit. A barbel, about an eighth of an inch, may be observed at the angle of the mouth. The origin of dorsal fin is equidistant between the extremity of the snout and the first rudimentary rays of the caudal. The caudal is long and deeply forked; its upper lobe projecting beyond the lower, although the structure of that fin is perfectly homocercal. The anal is inserted behind the dorsal. The insertion of the ventrals is situated a little behind the origin of the dorsal, and consequently a little nearer the rudimentary rays of caudal than to extremity of snout. The pectorals are moderate.

D II. 9. A II. 9. C 8. 1. 9. 8. 1. 7. V I. 9. P 17.

The scales are large; fifty-six of these may be counted in the lateral line, which, upon the abdomen, approximates more to the ventral than the dorsal outline. The upper regions of head and body are greyish brown; the sides and abdomen yellowish. The fins partake of the color of the region of the body to which they belong.

From the San Joaquin river, Cal.

19. POGONICHTHYS SYMMETRICUS, B. and G.—The specimens before us being in a rather poor state of preservation, a description of the species can hardly be drawn with accuracy. The size of the largest is about four inches and a half in total length; the profile of body is subfusiform, very compressed, and gracefully elongated. The head constitutes the fifth of the length. The eye is large and its diameter contained less than four times in the length of side of head. The lobes of the caudal fin are symmetrical. The anterior margin of dorsal is equidistant between the end of snout and the extremity of central rays of the caudal. The lateral line forms a gentle curve, convex downwards, upon the middle of the abdomen, and nearer the insertion of ventrals than base of dorsal. The insertion of ventrals is situated in advance of the anterior margin of dorsal, a character which will at once enable us to distinguish this species from *P. inequilobus*.

From Fort Miller, San Joaquin Valley, Cal.



Genus LAVINIA, Girard.

Mouth shaped as in *Gila* and *Pogonichthys*, but proportionally smaller than either and unprovided with barbel. Body covered with large scales as in *Pogonichthys*. The genus *Lavinia*, therefore, is intermediate between the two above mentioned.

20. *LAVINIA EXILICAUDA*, B. and G.—Body compressed, swollen upon its middle and tapering towards both extremities. Tail more particularly attenuated. Greatest depth, in advance of the dorsal, contained about four times in the length, which is eleven inches, and in which the head enters five times and a half. The mouth is very small; its angle being far from reaching the anterior margin of the orbit. The eye is circular and rather below the medium size; its diameter being contained nearly six times in the length of side of head. Isthmus very small; branchiostegal rays three on either side. Anterior margin of dorsal equidistant between the extremity of snout and tip of central rays of caudal, which latter fin is deeply forked. Base of anal longer than that of dorsal but considerably lower, particularly upon its posterior third. Insertion of ventrals in advance of the anterior margin of dorsal. Pectorals rather small.

D II. 12. A II 14 or 15. C 7. 1. 8. 8. 1. 7. V I. 19. P 17.

The scales are rounded and very thin. The lateral line, in which there are about sixty scales, forms an open curve on the abdomen with a downwards convexity much nearer the insertion of ventral than base of dorsal fin.

Reddish brown above, silvery grey on the sides, the scales being provided with minute crowded dots upon their margin. Beneath yellowish with scales unicolor. Fins yellowish grey.

From Sacramento River, Cal.

21. *LAVINIA CRASSICAUDA*, B. and G.—The body in this species is less deep in the middle and less attenuated behind than in *L. exilicauda*. The peduncle of the tail is largely developed and contrasts greatly with that of the latter mentioned species. The head and mouth are proportionally larger; the former being contained four times and a half in the total length; and the cleft of the second, although not reaching the anterior edge of the orbit, extends, nevertheless, farther backwards than in *L. exilicauda*. The greatest depth is about equal to the length of head. The eye is subcircular, and its diameter contained about six times in the length of side of head. The caudal is less emarginated posteriorly, and the insertion of ventrals situated almost under the anterior margin of the dorsal.

D II. 9 A II. 9. C 9. 1. 9. 8. 1. 8. V I. 9. P 17 or 18.

The scales are much larger than in *L. exilicauda*, and the course of the lateral line similar, being composed of about fifty-five scales. The general coloration is the same.

Specimens were procured at San Francisco, in the Rio San Joaquin, and several tributaries of that basin.

22. *LAVINIA CONFORMIS*, B. and G.—Only one specimen of this species was obtained; its total length being about four inches. It is related to *L. crassicauda*, having like it a much more compact tail than *L. exilicauda*. The general appearance of the fish is suggestive of *L. crassicauda*; the body is deeper and proportionally less elongated; the eye much smaller and the scales larger. Another distinctive mark between the two species consists in the position of the ventrals, the insertion of which in *L. conformis*, is situated in advance of the anterior margin of dorsal, whilst it is placed slightly behind it in *L. crassicauda*.

D II. 9. A II. 9. C 6. I. 9. 8. I. 6. V I. 8. P 16.

Purplish brown above, light on the sides; belly and head, beneath, dull yellowish.

From Posa creek, San Joaquin basin, Cal.

23. *LEUCOSOMUS OCCIDENTALIS*, B. and G.—Numerous immature specimens of this species were collected, together with one about five inches in length. The body is very much compressed, deepest upon the middle of its length and tapering towards both extremities. The greatest depth is contained four times in the

total length. The snout is subconical, head rather small, forming about the fifth of the total length, and slightly depressed above the eyes. The anterior margin of dorsal is nearer the base of caudal than to extremity of snout. The caudal is forked. Both the anal and dorsal are anteriorly elevated. Insertion of ventrals situated in advance of anterior margin of dorsal. Pectorals and ventrals of medium development.

D II. 11. A II. 12. C 8. I. 9. 8. 1. 9. V 10. P 15.

The scales are of medium size and provided with radiating ridges. The lateral line is bent downwards upon the abdomen, constituting a curve, the convexity of which is nearer the ventrals than to the dorsal outline. Greyish brown above; sides silvery; belly dull yellowish.

From Posa and Four creeks, the latter emptying into Tule lake, San Joaquin Valley, Cal.

#### CLUPEIDÆ.

24. *CLUPEA MIRABILIS*, G.—Specimens before us are from eight to nine inches in total length, the head forming about the fifth of that dimension. The greatest depth is equal to length of head. The lower jaw is longer than the upper, the posterior extremity reaches to a vertical which would pass through the middle of the pupil. The eye is subcircular and large; its diameter being contained a little less than four times in the length of side of head. The anterior rays of dorsal are almost as high as the fin is long. The insertion of ventrals is situated in advance of middle of dorsal.

D 3. 15. A 14. C 4. 1. 11. 11. 1. 3. V 9. P 18.

This species is closely allied to the common herring (*Clupea harengus*) by its general appearance; the absence of teeth upon the palatine, the conspicuousness of the vomerine teeth (which are most so of all), and the presence of but two rows of them upon the tongue, will enable any one to draw the distinction between the two species.

From San Francisco, Cal.

25. *MELETTA CÆRULEA*, G.—The body is slender, gracefully elongated, ten inches in total length, of which the head constitutes the fourth part, not including the caudal fin. The depth measured in advance of dorsal, stands in relation to the total length as one to six. The body tapers away backwards from the insertion of ventrals and dorsal; in advance of these fins to the occiput its depth is sensibly the same, when the head again gradually slopes, above and below, towards the snout. The posterior extremity of the maxillary reaches a vertical line which would intersect the middle of the eye. The posterior edge of opercular apparatus forms a uniform and rather flattened curve. The inferior branch of preopercle exhibits small radiating striæ; striæ more conspicuous are observed upon the inferior and inner half of opercle. The anterior margin of dorsal is nearer the snout than to the base of caudal. The ventrals are inserted opposite the posterior half of dorsal. Caudal deeply forked; anal long and low. Pectorals of medium development and acute upon their extremity.

D 3. 16. A 17. C 4. 1. 8. 8. 1. 4. V 8. P 18.

The scales are large, but few are preserved upon the specimen before us.

The back, upper part of the head and half of the sides are deep blue. Sides of head and lower half of flanks, silvery. Fins greyish or dull yellowish.

From San Francisco, Cal.

26. *ENGRAULIS MORDAX*, G.—The general physiognomy of this species is somewhat suggestive of *Engraulis enoracholus*, the common anchovy of Europe, from which, however, it may be distinguished chiefly by the position of the ventrals, the insertion of which is exactly opposite the anterior margin of the dorsal. The body is slender and compressed, sharp upon the ventral line. The greatest depth is comprised nearly seven times in the total length and almost twice in the length of the head. The eye is large and subcircular; its diameter being contained four times in the length of side of head. The anterior margin of dorsal is nearer the base of caudal than to the extremity of snout.

D 1. 15. A 20. C. 3. 1. 10. 9. 1. 2. V 8. P 16.

The back is deep bluish brown; the sides are silvery.

From San Francisco, Cal.



## PLEURONECTIDÆ.

### Genus PLATICHTHYS, Girard.

Eyes on the left side and general form of *Rhombus*, but differing from the latter genus by a smaller mouth, a dorsal fin commencing above the eye and leaving, as well as the anal, a considerable space between its posterior margin and the base of the caudal fin. The snout is protruding, the lower jaw being the longest. Small and conical teeth on both sides of the jaws. Lateral line nearly straight, making but a slight curve upwards immediately above the pectorals.

27. *PLATICHTHYS RUGOSUS*, G.—General form of body subelliptical; head rather long; snout projecting, lower jaw longest; a row of short conical teeth. Posterior extremity of upper maxillary extending a little beyond the anterior rim of orbit, and approximating closely to this organ when the mouth is shut. The diameter of the eye is contained about six times in the length of side of head. Head forming the fourth of the whole length. Caudal fin subrounded posteriorly.

D 57. A 42. C 3. 1. 7. 7. 1. 2. V 6. P 11.

The ventrals are small, rounded posteriorly, and are inserted slightly in advance of the base of pectorals, which are of medium development and likewise rounded posteriorly. Instead of scales, the body is covered with small groups of minute asperities, very rough to the touch. Lateral line slightly arched above the pectorals; rest of its course straight to the base of caudal fin.

Left side dark reddish brown; fins yellowish green; dorsal and anal with alternate vertical bands of the same color as the body; caudal with longitudinal bands of the same hue. Ventrals and pectorals unicolor. Right side dull yellow.

From San Francisco, Cal.

### Genus PLEURONICHTHYS, Girard.

Eyes on the right side; general form of *Platessa*. Head small; mouth very small. Origin of dorsal fin opposite the anterior margin of eye, and bent towards the colorless side of the fish. Teeth very inconspicuous, occupying both sides of the jaws. Dorsal and anal fins not reaching the base of caudal. Scales rather below the medium size; lateral line slightly arched above the pectorals.

28. *PLEURONICHTHYS CENOSUS*, G.—Body subelliptical; head small; snout very short, lower jaw longest; mouth quite small. Teeth minute, conical and acute. Posterior extremity of upper maxillary extending beyond the anterior rim of the orbit. Eyes on the right side and large, the diameter contained less than four times in the length of side of head. Head constituting a little less than the fifth of the entire length. Origin of dorsal in advance of the eye; its posterior margin as well as that of the anal does not unite with the caudal, between which a small space exists. The caudal is rather slender and posteriorly rounded. The insertion of ventrals is quite in advance of the base of pectorals. The outline of both pectorals and ventrals is rounded.

D 74. A 54. C 3. 1. 7. 6. 1. 3. V 6. P 1. 10.

Body covered with small scales on the right side, and minute ones on the left. Opercular apparatus apparently smooth, but on a careful examination exhibiting scattered and inconspicuous scales, intermediate in size between those of the sides. Lateral line almost straight, with a slight inflexion upwards, immediately above the pectorals.

Ground color of body and fins deep brown, maculated with black and yellowish.

From San Francisco, Cal.

### Genus PAROPHRYS, Girard.

Eyes on the right side. Body elongated as in *Solea*, but the head is conical, and the snout protruding, with the lower jaw longer than the upper. Mouth of

medium size. Teeth on the colorless side of the jaws only, as in the genus just mentioned. Dorsal and anal fins not extending to the caudal. Caudal truncated posteriorly. Lateral line almost straight, making but a small inflexion upwards above the pectorals. Scales small, covering the body and head.

29. *PAROPHRYS VETULUS*, G.—Body elongated, tapering considerably posteriorly, less so anteriorly where it is terminated by a wedge-shaped head and an acute snout. The head forms a little less than a fourth of the entire length, to which the greatest depth stands as one to three. The mouth is small, lower jaw longest; the posterior extremity of upper maxillary overruns slightly the vertical of the anterior rim of orbit. The teeth are minute. Eyes on the right side and very large, elliptically elongated and closely approximated, being separated by a narrow and elevated ridge; hence a sloping of either side of the ocular region. The longitudinal diameter of the eye is comprised four times in the length of the side of head. The dorsal fin begins above the eye, and terminates, as well as the anal, at a short distance from the base of caudal. The caudal is slender and posteriorly truncated. The pectorals and ventrals are small; the insertion of the latter being situated beneath the posterior extremity of the opercle.

D 86. A 64. C 3. 1. 7. 7. 1. 3. V 6. P 11.

The scales are very minute, and equally distributed over the body and head. The lateral line is nearly straight, making but a slight curvature, convex upwards just above the pectoral fin.

Ground color of body reddish ash, fins yellowish with small black spots irregularly scattered over body and fins.

From San Francisco, Cal.

#### Genus *PSETTICHTHYS*, Girard.

Eyes on either the right or left side. General form elongated as in *Solea*. Mouth rather large and oblique, lower jaw longest. Teeth slender and inconspicuous, occupying both sides of the jaws. Origin of dorsal fin opposite the anterior rim of orbit. Posterior margin of both dorsal and anal not reaching the base of caudal. Caudal posteriorly rounded. Scales very small. Lateral line slightly arched above the pectorals.

30. *PSETTICHTHYS MELANOSTICTUS*, G.—Body elongated; slender, tapering posteriorly. Greatest depth contained about three times in the total length, and head a little less than four times. Mouth large and oblique; lower jaw longest. Teeth slender. Posterior extremity of upper maxillary extending to a vertical line which would pass in advance of the pupil. Eyes on the right side and well developed, their diameter being contained four times and a half in the length of the side of head. The origin of dorsal is just above the eye and terminates, as well as the anal, before reaching the base of the caudal. The eight or ten anterior rays of dorsal are higher than the following ones. The central rays of caudal are the longest. The pectorals and ventrals are small and rounded upon their margin; the latter inserted considerably in advance of the former.

D 78. A 60. C 4. 1. 6. 6. 1. 3. V 6. P 12.

The scales are minute, covering the body and head. Ground color cinereous with crowded black dots, sometimes confluent or else grouped.

From San Francisco, Cal.

The above species, thus very briefly characterised, are to be more minutely described in an Appendix to Lieut. Williamson's official report of the Survey entrusted to his charge.



• *Enumeration of the species of marine Fishes, collected at San Francisco, California, by Dr. C. B. R. Kennerly, naturalist attached to the survey of the Pacific R. R. Route, under Lieut. A. W. Whipple.*

By CHARLES GIRARD.

1. *CHIRUS CONSTELLATUS*, G.—This species comes nearest to *C. guttatus*, of which it has the general physiognomy and structure of the fins; but the head above is less convex, and the scales very differently imbricated. Thus, whilst in *C. constellatus* they constitute oblique series which may be traced in any direction, the same is not the case in *C. guttatus*.

D XX. I. 25. A 24. C 5. 1. 8. 7. 1. 4. V I. 5. P 19.

The ground color is greenish grey; the body at large exhibiting indistinct, cloudy spots, and on the anterior and upper region, groups of black dots varying in number. Similar dots are scattered over the upper part and sides of head, and the pectoral fins are literally covered with them, so as to divide equally the space with the ground color which make these fins appear maculated with black and yellow.

2. *ATHERINOPSIS CALIFORNIENSIS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 134.

### Genus PORICHTHYS, Girard.

General form and external aspect similar to *Batrachus*, but more elongated; its generic features will consist in the series of pores extending to the whole length of body from divers regions of the head. There are neither scales on the body nor membranous appendages on the margin of the jaws. Two short tentacles in advance of the nostrils. The teeth are slender and acute; those on the vomer most conspicuous. The head is smooth; the opercle provided with one spine only.

*Obs.*—To this genus belong: 1st. *P. POROSISSIMUS* (*Batrachus porosissimus*, Cuv. and Val.) from the coast of Brazil; and 2d. *P. POROSUS* (*Batrachus porosus*, Cuv. and Val.) from Valparaiso.

3. *PORICHTHYS NOTATUS*, G.—Total length about nine inches and a half, the head forming the fourth of it in excluding the caudal fin. The mouth is broadly cleft; the posterior extremity of upper maxillary extending beyond the posterior rim of the orbit. The teeth upon the symphysis of the lower jaw are more slender and smaller than on the sides of that bone. The smallest teeth are those of the intermaxillaries extending almost to the whole length of these bones. The palatine teeth are a little larger posteriorly than anteriorly. The most conspicuous ones are observed on the vomer. Two minute and inconspicuous spines constitute the anterior dorsal fin. The second dorsal is somewhat higher than the anal, and the tips of the posterior rays of both of these fins reach the base of the caudal, there being but a narrow space left separating these fins from each other. The caudal is posteriorly rounded. The pectorals are spear-shaped; the central rays being the longest.

D II. 37. A 34. C 3. 1. 5. 5. 1. 2. V 3. P 20.

Upper regions purplish blue; sides and belly silvery grey. A subrescent shaped vitta beneath the eye.

4. *EMBIOTOCA LINEATA*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 134.

5. *AMPHISTICHUS ARGENTEUS*, Agass. Amer. Jour. Sc. second series, xvii. 1854, p. 367.

6. *HOLCONOTUS RHODOTERUS*, Agass. Amer. Jour. Sc. second series, xvii. 1854, p.

7. *MELETTA CÆRULEA*, Grd. Proc. Acad. Nat. Sc., Philad. vii. 1854, p. 138.

8. *GADUS PROXIMUS*, G.—This appears to be a rather small species, for, amongst numerous specimens brought home by several parties, and now before us, the largest measures less than six inches in total length. The body is slender,

elongated and compressed, rather graceful in appearance. The head is contained four times and a half in the total length. The snout is pointed, the upper jaw overlapping considerably the lower one. The mouth is proportionally large, the posterior extremity of the upper maxillary extending to a vertical line which would fall in advance of the eye. The eye itself is above the medium size, sub-circular in form, and contained about four times and a half in the length of the side of head. There exists a space between each dorsal, more considerable between the second and third, than between the first and second. The anals are likewise separated by a space nearly equal to that which is observed between the second and third dorsals. The ventrals are exiguous, their second ray being prolonged into a filament. The pectorals are small.

D 12. 19. 20. A 25. 22. C 5. 1. 16. 16. 1. 5. V 6. P 17.

Upper region yellowish ash; sides and belly silvery white. Minute crowded blackish dots upon the dorsals, caudal and posterior anal. Anterior anal, ventrals and pectorals yellowish, unicolor.

9. PAROPHRYS VETULUS, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1851, p. 140.

10. PSETTICHTHYS SORDIDUS, G.—General form subellipsoid; greatest length about five inches in which dimension the greatest depth enters twice and a third of a time. The head constitutes about the fourth of the total length. The mouth is oblique, and when shut the jaws are even. The eyes are large, subelliptical, approximated, and situated on the left side; their longitudinal diameter is comprised four times in the length of the side of head.

D 82. A 72. C 1. 1. 6. 5. 1. 1. V 6. P 1. 10.

The scales are of medium size, equally conspicuous upon the head and opercular apparatus. The lateral line is nearly straight, raising but slightly as it reaches the head.

Ground color of a soiled yellow; the scales are margined with blackish. The fins appear as if covered with a coating of dust.

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*Observations upon a collection of Fishes made on the Pacific coast of the United States, by Lieut. W. P. Trowbridge, U. S. A., for the Museum of the Smithsonian Institution.*

By CHARLES GIRARD.

It is praiseworthy for officers of the government, whether military or civil, when detailed upon special duties, to devote their moments of leisure in serving the cause of science. Lieut. Trowbridge, while engaged under instructions from the U. S. Coast Survey, in making tidal observations for the use of that office, availed himself of such opportunities at his command to secure the fishes enumerated below, and we leave it to Naturalists to decide whether his labors were at all rewarded.

There are three main points whence specimens were obtained. 1st, PRESIDIO, on the Bay of San Francisco, where Lieut. Trowbridge himself is stationed; 2d, MONTEREY, on the Bay of the same name, where the same gentleman made several excursions; and, 3d, SAN DIEGO, where observations are conducted by Corporal A. Cassidy, U. S. A.

#### PERCIDÆ.

1. LABRAX NEBULIFER, G.—The head which is contained about three times in the length, the caudal fin excepted, presents a subconical appearance, from the fact of its being rounded upon its upper region, and gradually sloping towards the snout. The anterior part of the body, from the origin of the dorsal to the occiput is continuous with the profile of the head, the middle region slightly convex. The body gradually tapers backwards; the greatest depth taken between the insertion of ventrals and origin of first dorsal, is a little less than the fourth of the entire length, including the caudal fin; the greatest thickness measures in the same region as the depth, is a little more than the half of the latter. The body, therefore, is compressed, as usual in this genus, and the



general outline subfusiform. The eye is subcircular, and its horizontal diameter contained about six times in the length of side of head. The posterior extremity of the upper maxillary extends to a vertical line intersecting the pupil. The lower jaw is the longest. The third dorsal spine is much the longest in the first dorsal fin, and higher than any of the rays constituting the second dorsal. The caudal is subemarginated posteriorly. The insertion of pectorals is placed immediately in advance of the origin of anterior dorsal; the insertion of ventrals is situated immediately behind the base of pectorals.

D X. 14. A III. 8. C 4. 1. 7. 6. 1. 3. V I. 5. P 17.

The scales are of medium size. The lateral line follows the curve of the back and middle of the peduncle of tail.

Ground color reddish brown above, yellowish beneath, upper part of body provided with large cloud-like blackish blotches. A dark vitta extends obliquely downwards and backwards from the lower rim of orbit to the throat, across the cheeks and branchiostegal apparatus. The fins are purplish blue, very intense on the ventrals, base of second dorsal, and space between the third and fourth spine of first dorsal. The snout is covered with small roundish spots.

From Monterey, Cal.

2. *LABRAX CLATHRATUS*, G.—The profile of upper part of head is more depressed, and the head more acute than in *L. nebulifer*. The lower jaw is more protruding, giving to the snout a pointed, instead of a rounded appearance, which it has in the preceding species. The fourth dorsal spine is the longest and equal in height to the highest rays of the second dorsal. The diameter of the eye is contained five times in the length of head. The origin of first dorsal is situated exactly opposite the base of pectorals.

D X. 13. A III. 7. C 3. 1. 7. 6. 1. 2. V I. 5. P 15.

Ground color purplish; belly whitish; upper part of back and sides covered with darker blotches, assuming an irregular fenestrated appearance. Pectorals yellowish, with a few sulphur transverse vittæ. Membrane of other fins purplish, second dorsal spotted. A subocular vitta passing nearer the angle of the mouth than in the preceding species.

From San Diego, Cal.

## TRACHINIDÆ s. PERCIDÆ.

### Genus *HETEROSTICHUS*, Girard.

First dorsal fin very long, the first five anterior rays of which constitute an apparently distinct fin. Anal very long, provided anteriorly with but few spines. Dorsal and anal extending to near the caudal. Body very compressed and flattened posteriorly. Caudal slender. Ventrals situated in advance of pectorals. Lower jaw longest; mouth moderate. Teeth small and conical. Scales very small. Lateral line arched above the pectorals. Six branchial rays. Opercular apparatus without either spines or denticulations.

3. *HETEROSTICHUS ROSTRATUS*, G.—The head is rather small and conical, contiguous to a body anteriorly deep, tapering posteriorly, and very much flattened throughout. The nose is very much depressed and concave. The greatest depth measured above the pectorals, is contained five times in the entire length; the least depth is about the fourth or fifth of the greatest. The head forms a little less than the fourth of the length. The mouth is moderate, lower jaw much the longest; and the posterior extremity of upper maxillary reaches a vertical line, which would pass in advance of the pupil. The teeth are conical, slender and exiguous. The eye is subelliptical, and its horizontal diameter contained seven times and a half in the length of side of head. The dorsal fin originates at a very short distance from the occiput. The five first rays constituting an apparently distinct fin, subtriangular in shape, and much higher than the portion which follows, and which upon its anterior half, is higher than the posterior half. The soft dorsal is short, but high and in perfect continuity with the spiny one; the tips of its posterior rays not reaching quite as far back as

those of the anal, which approximate to the base of caudal. The caudal is slender and forked. The anal is very long and higher than the corresponding portion of dorsal; it is highest posteriorly and lowest upon the middle. The base of the pectorals falls under the space between the third and fourth dorsal spines. The ventrals are inserted much in advance of the base of pectorals, immediately under the throat; they are quite small and slender. The pectorals themselves are of but medium development.

D XXXVII. 13. A II. 34. C 4. 1. 5. 4. 1. 3. V I. 3. P 13.

The scales are very small, extending over the upper part of opercular apparatus to the cheeks; also to the rays of the fins to about half their height or length. The lateral line, from the upper angle of opercle runs almost straight till about under the twelfth spine of dorsal, then obliquely downwards until near the middle of flanks, thence straight to the base of caudal.

Ground color above yellowish brown with irregularly transverse blotches, or else interrupted, and then constituting longitudinal bands of a deeper hue. Head above deep brown; upper part of opercular apparatus exhibiting an elongated triangularly acute blotch, starting from the rim of the orbit. Sides and inferior surface of head yellowish. Belly dull yellow. Fins yellowish, blotched, except the pectorals, which are barred transversely, and the ventrals which are unicolor.

Greatest length of specimen described about eleven inches.

From San Diego, Cal.

#### SPHYRÆNIDÆ s. PERCIDÆ.

4. *SPHYRÆNA ARGENTEA*, G.—A specimen of this species which lies before us, is thirty-five inches in total length, of which the head forms a little less than the fourth part. The body is stoutish, thickest upon its middle and somewhat compressed, the depth being about one-third more than the thickness. The mouth is moderate; the posterior extremity of upper maxillary leaves a distance of three fourths of an inch between it and the vertical of the anterior rim of the orbit. Teeth on the intermaxillary, minute; on the lower jaw, moderate; on the palate, conspicuous and strong.

The eye is subelliptical, its anterior rim a little nearer to the tip of lower jaw than to the posterior flap of opercular apparatus. The scales on the cheeks are smaller than upon the opercular pieces; there are none to be seen in advance of the eye. The posterior extremity of anterior dorsal is nearly equidistant between the tip of lower jaw and the base of central rays of caudal. The latter is deeply forked. The extremity of pectorals is very far from reaching the anterior margin of first dorsal. The upper margin of both, the second dorsal and anal, is concave.

D V. I. 11. A 1.9. C 4. 1. 8. 8. 1. 3. V I. 5. P 13.

The scales are of rather medium size on the flanks, smaller on the back. The lateral line is straight.

The ground color of the upper region of head and body above the lateral line, is bluish black; whitish on the sides and yellowish on the abdomen. The scales have an argentine reflection which extends to the sides of the head and lower jaw. The lateral line is black. The membrane of the dorsal, caudal, anal and pectorals is yellowish, and their rays greyish; the ventrals are uniform yellowish.

From San Diego, Cal.

#### COTTIDÆ s. CATAPHRACTI.

5. *COTTOPSIS PARVUS*, G.—May readily be distinguished from *Cottoopsis gulosus* by a more compact and more fusiform body, a smaller head and consequently a much smaller mouth. The pectorals and ventrals are less developed, and the outline of the first dorsal is more convex. The caudal is posteriorly subtruncated. The insertion of ventrals is situated immediately behind the base of pectorals, and a little in advance of the origin of the first dorsal; and when brought backwards, their tip does not reach the anus. The tip of pectorals extends to a vertical line which would pass in advance of the origin of anal. The anal is much lower than the second dorsal.

D VIII. 21. A 15. C 5. 1. 4. 4. 1. 4. V I. 4. P. 15.



The head constitutes the fourth of the total length; it is quite depressed, and slopes gradually towards the snout; its width is one fourth greater than its depth. The eyes, of medium size, are placed near the summit of the head; their form is subcircular, and their horizontal diameter contained four times and a half in the length of side of head. The posterior extremity of upper maxillary reaches a vertical which would pass in advance of the pupil.

Minute prickles are scattered all over the skin, more developed above the lateral line than beneath it. The lateral line, itself very conspicuous, follows the curve of the back uninterrupted to the base of caudal.

Ground color yellowish brown above and on the sides; dull yellowish beneath. Sides and back with darker somewhat confluent blotches, or else groups of crowded dots resembling blotches. The pectorals, dorsals and caudal are barred; the anal and ventrals unicolor. First dorsal with a blackish blotch upon its upper and posterior portion. Base of caudal with a black bar, upper surface of head covered with dark roundish small spots.

From Presidio, Cal.

6. *LEPTOCOTTUS ARMATUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 131.

Specimens of this species, most of which are in an immature condition, were obtained at Presidio, Monterey, San Pedro, and San Diego, Cal.

7. *SCORPÆNICHTHYS MARMORATUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 131.

From Presidio, Cal.

8. *SCORPÆNICHTHYS LATERALIS*, G.—We know but a few small individuals of this species, the largest of which is less than four inches long. The body is compressed and tapering; the head being contained about three times in the length, excluding the caudal fin. The occipital region is flattened; the interocular space, convex, and the rostral distance, declive. The mouth is large; the posterior extremity of upper maxillary extends to a vertical line, which would intersect the posterior margin of the pupil. The eye is large, subcircular, and placed near the summit of the head; its horizontal diameter is contained four times in the length of the side of head. The interocular space is quite narrow. The opercular apparatus exhibits but a double spine of moderate development, situated upon the upper half of the limb of preopercle, with its point directed obliquely upwards. The caudal fin is posteriorly subrounded. The insertion of ventrals is situated under the middle of the base of pectorals. The origin of the dorsal is in advance of base of the same fins. The first dorsal is rather low, and not contiguous to the second, which is considerably higher.

D IX. 17. A 11. C 2. 1. 5. 4. 1. 1. V I. 3. P 15.

On the upper portion of dorsal region, alongside the dorsals, may be seen an elongated area covered with small pectinated scales or plates, disposed upon oblique or transverse rows. The skin is otherwise smooth, and the lateral line conspicuous, making a slight inflexion downwards upon the middle of the abdomen.

Upper region of head and body deep chestnut brown, variegated on the sides with shining yellowish areolæ and dots. Inferior surface of head, belly and tail uniform yellow. Fins spotted or barred.

From Monterey, Cal., and San Luis Obispo, Cal.

#### SCORPÆNIDÆ s. CATAPHRACTI.

9. *SCORPÆNA GUTTATA*, G.—The head has a pretty rough appearance: in the first place, the orbits seem as if emerging from the upper part of the skull, the middle line of which exhibits an obtuse groove. Three spines are observed along the upper edge of the orbit, behind which three more may be seen on either side of the occipital region and nape. Several supratympanic spines, but small; two diverging ones, upon the body of opercle, and four upon the limb of preopercle, the uppermost of which being much the stoutest and longest. Next we see four other spines irradiating downwards from the suborbitals, and finally the nasal bone terminates into a sharp and acute point directed upwards and slightly backwards. Intermingled with these numerous spines there are but two

pairs of small membranous and arborescent flaps,—we were going to say,—adorning the head, but in reality contributing to render it still more repulsive to an eye uninitiated to scientific pursuits: the first pair is situated above the posterior part of the orbit, whilst the second occupies the inner upper edge of anterior nostril. The body is about eleven inches in total length, the head forming the third of it. The eye is large and elliptical: its horizontal diameter being comprised nearly five times in the length of side of head. The posterior extremity of upper maxillary reaches a vertical line which would intersect the posterior rim of orbit. The second dorsal has nearly the same height as the first. The caudal is subrounded posteriorly. The tips of posterior rays of anal are even with those of the second dorsal. The insertion of ventrals is under the base of pectorals; they are elongated. The pectorals are broad and very much developed; their posterior extremity extending considerably beyond that of ventrals.

D XII. 10. A III. 5. C 5. 1. 6. 5. 1. 3. V I. 5. P 18.

The scales of body are of medium size, and very small upon the occipital region and the head. The opercular apparatus is naked; scales being observed upon the posterior flap of opercle only. Ground color deep reddish brown above; yellowish brown beneath. The anterior portion of back and head almost black. Clouded patches of blackish, here and there, with numerous small black spots, more defined on the head than on the body, and much larger on the fins. Belly dull white; throat yellowish; inferior surface of head whitish and brownish.

From Monterey, Cal.

10. *SEBASTES AURICULATUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 131. From Presidio, Cal.

11. *SEBASTES ROSACEUS*, G.—The general form of this species might at first be suggestive of *S. norvegicus*, were the central rays of the first dorsal not so much higher than in the latter species, giving to that fin a decided convexity. The fish is rather stout than elongated, though much compressed, the depth of body being about equal to the third of entire length, which is about fourteen inches, and nearly equal to the length of head. The profile from the anterior margin of first dorsal to the end of snout is rather depressed, whilst it tapers quite rapidly from the second dorsal backwards, the peduncle of the tail being rather detached from the general shape. The upper part of head exhibits but two small horizontal spines, whilst the preopercle has five of them, rather stout and conspicuous. The upper part of opercle has two spines, the uppermost of which is the largest. The eyes are large and subcircular, reaching the upper profile of head, in the length of which their horizontal diameter is comprised four times, once in advance the anterior rim of orbit, and twice behind its posterior rim. The mouth is broad, but the posterior extremity of upper maxillary does not extend beyond a vertical line which would intersect the centre of the pupil. The second dorsal is scarce higher than the first. The posterior margin of caudal is slightly concave. The second spine of the anal is strong and robust; the tips of the posterior soft rays of that fin extend somewhat farther back than those of the second dorsal, but do not reach the base of the rays of the caudal. The insertion of ventrals is situated immediately behind the base of pectorals. The pectorals are very long, their tips extending beyond that of ventrals, and reaching a vertical line which would fall between the two dorsals.

D XIII. 13. A III. 7. C 5. 1. 5. 5. 1. 6. V I. 5. P 17.

The scales of the body are of medium size; those upon the head, cheeks, opercular pieces and throat are quite small. The course of the lateral line is parallel to the outline of the back.

The color is of a uniform reddish or crimson tint, lighter beneath. There exists, on the upper part of opercle, in the region occupied by the spines above alluded to, a large, elongated spot of a much deeper hue.

From San Diego, Cal.

12. *SEBASTES FASCIATUS*, G.—The species which we propose here to characterize, has more of the general aspect of a *Scorpena*, than of the genus to which it belongs. The body, anteriorly, is very stout and deep, the head more rounded,



with its upper profile more inclined from the occiput to the snout than in the preceding species. The total length of the fish is about eleven inches, of which the head forms more than the third. The greatest depth is equal to the length of head. The upper surface of the latter exhibits conspicuous spiny ridges, very acute posteriorly. Five triangular spines occupy the limb of preopercle and two the upper part of opercle. The posterior extremity of upper maxillary reaches a vertical line which would pass behind the pupil. The outline of anterior dorsal is convex and about the same height as the second. The caudal, posteriorly, is subrounded. The tips of posterior soft rays of anal are even with the tips of posterior soft rays of second dorsal, and both fins approximate the base of caudal. The ventrals are long and their tip reaches the vent. The pectorals are broad and extend a little farther back than the ventrals, the insertion of which is situated upon a line behind their base.

D XIII. 13. A III. 7. C 2. 1. 6. 5. 1. 3. V I. 5. P 18.

The scales are rather above the medium size; those on the head and opercular bones being comparatively more developed than in the preceding species. The lateral line is parallel to the outline of the back.

The ground color is greenish sulphur yellow; purplish black patches over the head, sides of body, and fins, in the midst of which patches appear crowded whitish spots. An area of ground color may be traced from the third and fourth dorsal spines obliquely downwards and backwards, towards the base of the caudal; in an oblique direction from the dorsal fin to the lateral line; then along the course of lateral line to the base of caudal fin. The throat is deep sulphur yellow; the inferior surface of the head and belly is spread all over with a more dull tint.

From Presidio, Cal.

#### HETEROLEPIDÆ s. CATAPHRACTI.

13. *CHIRUS GUTTATUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 132.

From Presidio, Cala.

14. *CHIRUS CONSTELLATUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 141.

From Presidio, Cal.

#### GASTEROSTEIDÆ s. CATAPHRACTI.

15. *GASTEROSTEUS PLEBEIUS*, G.—The general appearance of this species is subfusiform in its profile and rather short. The depth upon the middle region of the body is a little less than the fourth of the length, whilst the head is contained in it three times and a half. The eye is of medium size and circular, its diameter entering four times in the length of the side of head. Mouth of medium size, lower jaw the longest. Upper surface of head minutely granular under a magnifying glass. Two well developed spines on the back, and a much smaller one preceding the soft rays of the dorsal. Posterior margin of the caudal, slightly crescentic. Ventral spines very much developed, inserted slightly in advance of the second dorsal spine, and denticulated upon either edge. Base of the pectoral situated in advance of the first dorsal spine.

D I. I. I-11. A I-9. C 3. 1. 5. 5. 1. 2. V I. 1. P 10.

The body is anteriorly plated from the head to the second dorsal spine; otherwise smooth and keelless on the sides of the peduncle of tail.

Ground color reddish yellow, blotched with blackish brown; blotches assuming sometimes the shape of vertical bands. Beneath silvery. Minute and crowded black dots are spread all over the body, head and fins.

From the salt marshes about Presidio, Cal.

16. *GASTEROSTEUS INOPINATUS*, G.—General form slender, elongated, tapering considerably from the origin of anal backwards. Peduncle of the tail slender and long. The greatest depth, measured above the ventrals, is contained five times in the entire length; the head, on the other hand, falls a little short of the fourth of the same length. The eye rather large, is subcircular; its horizontal diameter enters three times and a half in the length of side of head; once in advance of the anterior rim of the orbit. The mouth is shaped as in the preceding

species. The upper surface of head exhibits some minute granules when examined with a magnifying glass. There are two slender dorsal spines and another, small, precedes the soft rays of dorsal fin. Posterior margin of caudal subconcave. Ventral spines slender, inserted immediately in advance of the second dorsal spine and very minutely serrated above, inconspicuously beneath. Base of pectorals just in advance of anterior dorsal spine.

D I. 1. I. 10. A I. 9. C 3. 1. 5. 5. 1. 3. V I. 1. P 10.

The body is anteriorly plated as in the preceding species, and smooth posteriorly.

Ground color above yellowish, densely dotted with blackish; abdomen silvery.

From a fresh water lagoon about one mile back of Presidio, Cal., where according to Lt. Trowbridge, no larger fish occur.

#### SCIÆNIDÆ.

17. *UMERINA UNDULATA*, G.—Greatest length of specimen described, six inches, the head being comprised in it four times and a half. Body much compressed, particularly the upper part of flanks. Head and snout rounded; mouth rather small; posterior extremity of upper maxillary extending to a vertical line which would pass in advance of the orbit. Eye subelliptical, its horizontal diameter being contained five times in the length of side of head. First dorsal subtriangular; its anterior margin is situated a little behind the base of pectorals. The second dorsal, a little higher anteriorly than posteriorly, is twice and a half as long as the first. The caudal is posteriorly subtruncated. The anal is about one third deeper than its base is long, and as deep as the first dorsal is high. The posterior extremity of pectorals extends to a line which would intersect the first ray of second dorsal. The tip of ventrals extends beyond that of pectorals without reaching the vent.

D IX. 1. 25. A I. 9. C 3. 1. 7. 7. 1. 2. V I. 6. P 20.

The scales are of medium size; those on the cheek and opercular apparatus are quite conspicuous. The lateral line is slightly arched under the first dorsal fin, otherwise parallel to the dorsal outline of the body.

Upper regions silvery-ash; inferior regions dull yellowish. Sides beneath the lateral line exhibiting oblique and undulated series of small greyish spots in the midst of a somewhat lighter ground of the same hue.

From San Diego, Cal.

18. *GLYPHISODON RUBICUNDUS*, G.—The head has a very short appearance as well as the body itself. The largest specimen measures nine inches and a half in total length, of which the head forms a little less than the fourth. The anterior upper part of body is very convex and the profile of the head very declive with two depressions, one above, the other below the ocular region. The mouth is small and the lips very fleshy. The eye is situated high up, small and circular, and contained five times in the length of the side of head by its diameter. The greatest depth, measured above the ventrals, is a little less than twice the length of head. The dorsal fin begins a little behind the base of pectorals; its spinous portion is low and its upper margin almost straight; the soft part rises into a subtriangular shape. The peduncle of tail is well defined, free above and below; the dorsal, however, coming nearer to the base of caudal than the anal does. The caudal is very large, deeply emarginated, but the lobes are uniformly rounded and broad. The soft portion of anal has the same conico-triangular shape as the soft dorsal. The ventrals are elongated and inserted behind the base of pectorals. The latter are quite broad, rounded upon their external margin; their posterior extremity falling short of that of the ventrals.

D XII. 16. A II. 15. C 3. 1. 6. 7. 1. 2. V I. 5. P. 19.

The scales of the body are very large, and so are those of the opercle. On the preopercle and cheek they are smaller. The scales extend to the dorsals, caudal and anal fins to nearly their extremity: on the spinous dorsal they are very conspicuous, whilst they become very small and almost minute on the caudal, soft dorsal, and anal.

The color is uniform deep crimson red throughout. The ventrals are exter-



nally margined with black. The lips appear to have had a deeper hue, as also the two cephalic depressions above alluded to.

From Monterey, Cal.

#### SCOMBERESOCES.

19. *BELONE EXILIS*, G.—The head forms a little more than two sevenths of the entire length, which measures about twelve inches and a half. The body is very slender and exiguous. The head is flattened upon the occiput, and grooved between the eyes. The eye is well developed and its longitudinal diameter comprised about eleven times in the length of the side of head; seven times in advance of its anterior rim, and three times backwards of its posterior rim. The anterior portion of anal is more developed than the same part in dorsal, the posterior extremity of which is but seven tenths of an inch distant from the rudimentary rays of the caudal: the anal does not extend quite as far back. The anterior margin of the latter is situated considerably in advance of the dorsal, and its base is longer also. The insertion of ventrals is equidistant between the base of caudal fin and the centre of the pupil. The posterior margin of the caudal is emarginated.

D 16. A 13. C 4. 1. 7. 6. 1. 3. V 6. P 14.

The scales are quite small, few of which only are preserved on the specimen described.

Back deep greenish; sides and belly rufous with an argentine reflection upon the sides. Pectorals, ventrals, and anal greenish yellow; dorsal and caudal greenish grey.

From San Diego, Cal

#### BLENNIDÆ.

20. *BLENNIUS GENTILIS*, G.—The body is very much compressed and tapering, from head, where deepest, to the base of caudal. The head constitutes the fifth of total length; the snout is very abbreviated and rounded. The greatest depth is about equal to the length of head. The mouth is rather large; the posterior extremity of upper maxillary reaching a vertical line which would intersect the middle of the pupil. The eye is large and circular, and its diameter contained four times in the length of side of head. A flattened and slender membranous flap is inserted above the eye. Soft portion of dorsal higher than the spiny part; anal much lower than dorsal. Ventrals long and filiform. Caudal posteriorly rounded, tips of both dorsal and anal reaching its base. The lateral line terminates under the eleventh ray of the spiny dorsal.

D XII. 17. A 19. C 6. 1. 5. 4. 1. 5. V I. 2. P 12.

Ground color yellowish-brown. Dorsals, caudal, and pectorals maculated with dark purple. Blotches of the same hue may be seen all along the back. Sides of abdomen and head marked with small subquadangular spots also of dark purple. Upper part of head, snout, ventrals, and anal deep purple. Tips of rays of anal yellowish.

From Monterey, Cal.

21. *GUNELLUS ORNATUS*, G.—Body very much compressed, preserving its depth from head to origin of anal, hence gradually diminishing towards the caudal. Head small, rounded anteriorly, and contained nine times and a half in the total length. Posterior extremity of upper maxillary extending to a vertical line which would pass slightly behind the anterior margin of the orbit. Eye circular and of medium size; its diameter being contained about four times in the length of side of head. Dorsal and anal fins very low and united to the caudal. Origin of dorsal immediately behind the base of pectorals. Caudal posteriorly rounded. Origin of anal equidistant between base of pectorals and extremity of caudal. Ventrals reduced to a small spine, inserted immediately in advance of the base of pectorals.

D 76. A 35. C 2. 1. 8. 8. 1. 1. V I. P 12.

The scales are very minute; the lateral is not discernible.

Ground color yellowish; back marked with thirteen roundish spots of blackish

brown, two of which situated in advance of the dorsal fin. Occasionally, vertical bands of a lighter hue may be observed on the sides, though in a very obsolete manner in the specimen before us. There is an oblique vitta upon the occiput extending from the eye towards the back, an interocular spot, and a suborbital vitta from the orbit to the inferior surface of head. Lips blackish. Pectorals and anal yellow. Caudal greyish yellow.

From Presidio, Cal.

#### Genus APODICHTHYS, Girard.

This genus is framed to include such species, as, having the general fascies of *Gunellus*, are characterized by the total absence of ventral fins.

The *Gunellus apos* of Kamtschaka is to come under this heading, under the appellation of *Apodichthys apos*.

22. *APODICHTHYS FLAVIDUS*, G.—The species referred to is between eleven and twelve inches long. Its head is anteriorly rounded and truncated, and is contained over nine times in the total length. The eye is rather small and subcircular, contained about seven times in the length of side of head. The mouth is large, obliquely directed upwards, and the posterior extremity of the upper maxillary extends to a vertical line which would pass behind the orbit. The origin of dorsal is situated opposite the base of pectorals. A stylet-shaped bone in advance of the anterior margin of anal, which is much nearer the extremity of caudal than to the base of pectorals. The pectorals are short and rounded upon their margin. The rays of the fins, as nearly as we can ascertain, are as follows :

D 86-90. A 40. C 4. 1. 11. 10. 1. 3. V 0. P 17.

The scales are exceedingly small, and the lateral line not visible.

Uniform yellowish, with a slight greyish hue. A narrow oblique black vitta from eye to occiput, and a similar one from the inferior rim of the orbit to the angle of the mouth.

From Presidio, Cal.

23. *APODICHTHYS VIOLACEUS*, G.—The specimen before us is much smaller than that from which the above species was described, having but three inches and three-fourths of total length, in which the head is contained seven times. The eye is subcircular, of medium size, and its horizontal diameter contained five times in the length of the side of head. The mouth is likewise obliquely directed upwards ; but the posterior extremity of the upper maxillary extends only to a vertical line which would intersect the pupil. The origin of the dorsal is situated immediately behind the base of the pectorals : its anterior third is lower than the rest. The origin of the anal, which is much lower than the two posterior thirds of the dorsal, is much nearer the base of the pectorals than to the extremity of the caudal. The latter is very small, posteriorly rounded, and contiguous to both the dorsal and anal. The pectorals are short and rounded.

D 65. A 42. C 2. 1. 7. 6. 1. 2. V 0. P 10.

The scales are small, but proportionally larger than in the preceding species ; and the lateral line, which is very conspicuous, may be traced from the upper margin of the opercle to near the caudal ; from the opercle it ascends obliquely for a certain distance, and then follows the outline of the back, keeping much nearer the base of dorsal fin than the middle of the flanks.

The anterior portion of body and head is of a uniform deep violet ; the posterior portion exhibits a somewhat brownish ground, over which is spread a violaceous tint ; the fins are all deep violet. A deep purple crescent-shaped vitta extends from either eye to the occiput. Two oblique vittæ on the sides of head, starting, one from the anterior, the other from the posterior half of orbit to the branchiostegal apparatus. The interocular space is likewise marked with a transverse narrow band slightly convex backwards.

From San Luis Obispo, Cal.

24. *ANARRICHAS FELIS*, G.—Two large specimens of this fish were received in such a precarious state of preservation that there was no possibility of keeping



the whole, and accordingly the bony frame alone lies before us. The zoological characters of the species, as far as we could ascertain, differ from those of each of the species previously described; but having mislaid the notes taken at the time of unpacking the collection, we do not feel justified in giving a diagnosis of them from recollection, and merely record the species under the above specific name.

From Monterey, Cal.

#### LOPHIDÆ.

25. *PORICHTHYS NOTATUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 141.

From Presidio and Monterey, Cal.

#### LABRIDÆ.

26. *JULIS MODESTUS*, G.—Body slender, elongated, and much compressed, tapering posteriorly from the origin of anal. The greatest depth, measured upon the middle of the abdomen, enters five or six times in the total length. The head is subconical, and constitutes about the fifth of the entire length. The eye is large, subcircular, and its horizontal diameter is contained four times and a half in the length of side of head. The dorsal commences above the base of the pectorals, being quite low for about half its length, and terminating at about three quarters of an inch from the base of the caudal. The origin of the anal is opposite the eleventh ray of the dorsal, and extends a little further back; the depth of that fin is equal to the height of the portion of the dorsal opposite to it. The caudal is posteriorly subtruncated. The insertion of ventrals is opposite the posterior extremity of base of pectorals, and their tips do not extend as far back as those of the latter fins.

D IX. 13. A III. 12. C 4. 1. 6. 5. 1. 3. V I. 5. P 12.

The scales are very large; the fall of the lateral line takes place in advance of the posterior extremity of the base of dorsal fin.

Rufous brown above, yellowish upon the sides, and dull whitish yellow beneath. Anterior seven dorsal spines with a black spot at their base; a blackish blotch at the base of the caudal.

From Monterey and San Diego, Cal.

#### ATHERINIDÆ.

27. *ATHERINOPSIS CALIFORNIENSIS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 134.

From Presidio, Cal.

#### EMBIOTOCIDÆ.

28. *EMBIOTOCA JACKSONI*, Agass. Amer. Jour. of Sc. Second series, xvi. 1853, p. 387.

From Presidio, Cal.

29. *EMBIOTOCA LINEATA*, G. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 134.

A large specimen of this species, collected at San Diego, Cal., contained five young ones, the total length of the largest being nearly three inches, and its depth equal to the third of its length. Their bodies are light reddish orange, with the peculiar longitudinal light stripes very conspicuous. The two anterior thirds of dorsals, the anterior third of anal, and the base of ventrals exhibiting a deeper reddish orange; the posterior portion of dorsal and of anal fins are rather yellowish. An elongated jet black spot exists near the base of the anterior portion of the soft dorsal; the tip of ventrals is black; the margin of the anterior dorsal fin also black.

The caudal is long and truncated; the extremities of both the dorsal and anal fins extend beyond the base of caudal as appears to be the case in the young of *Rhacochilus toxotes*.

From Presidio and San Diego, Cal.

30. *EMBIOTOCA CASSIDYI*, G.—There is another species of *Embiotoca*, the young of which exhibit the same structure of the fins as observed in those of *E. lineata*

and *Rhacochilus toxotes*. We have before us five immature specimens, the largest of which measures but two inches and a half, and is consequently smaller than the largest of *E. lineata*. They were collected by A. Cassidy, and sent with other specimens, without mention being made whether caught freely swimming in the water, or taken by him from the parent fish. At any rate they are easily distinguished from those of *E. lineata* in possessing numerous transverse greyish bands more or less regular from head to tail and from dorsal to ventral line. The anterior portion of anal, the anterior edge of soft dorsal, the tip of spines of first dorsal, and the ventrals are blackish: the remaining parts of these fins, as well as the caudal and pectorals, are yellowish. The caudal is slightly emarginated posteriorly.

Adult specimens of this species have not yet fallen under our examination. We have not hesitated in establishing it as distinct from those already described after the careful study of the young in that family.

From San Diego, Cal.

31. *HOLCONOTUS RHODOTERUS*, Agass. Amer Jour. of Sc. Second series, xvii. 1854, p. 368.

Sixteen young were taken from the parent body; they are from eight-tenths of an inch to an inch long. A small vitelline sac is still to be observed at the abdominal region. The general form is slender and elongated. The head is deeper than the body and rounded; the snout much less prominent than in the adult; its general outline resembling more that of an adult *Amphistichus*. The vertical fins are much more developed than in the parent; the caudal is rounded off, the central rays being the longest. The soft dorsal and anal are likewise higher and extend posteriorly to the base of the caudal if not slightly beyond it, the dorsal at least.

Coloration uniform light yellowish; fins whitish of an extreme transparency owing undoubtedly to their having but shortly escaped from the egg.

Specimens were obtained at Presidio and San Diego, Cal.

32. *HOLCONOTUS TROWBRIDGII*, G.—This species is about the size of *H. rhodoterus* of which it has the general appearance. The body, however, is proportionally less elongated and consequently more deep. The greatest depth, measured between the origin of the first dorsal and the base of the ventrals, is contained three times in the total length, whilst the head enters in it four times and three fourths. The anterior portion of the body is superiorly very convex, and the upper surface of head sloping rapidly towards a rounded snout terminated by a very small mouth; considerably smaller than in *H. rhodoterus*, whilst the teeth are much shorter than in the latter species. The eye is large and circular, and contained but three times in the length of the side of head; the distance between the anterior rim of the orbit and the end of the snout is less than one diameter of the eye. A line drawn vertically down from the origin of the first dorsal would pass immediately behind the base of the pectorals. The base of the anal is comprised six times and a half in the total length of the fish, whilst in *H. rhodoterus* the base of the same fin enters in the length of said species but five times. The base of the ventrals is nearly equidistant between the symphysis of the lower jaw and the posterior extremity of the base of anal; in *H. rhodoterus* it is nearer to the snout.

D IX. 13. A III. 14. C 5. 1. 6. 6. 1. 4. V I. 5. P 1-16.

The size of the scales is nearly the same in both *H. trowbridgii* and *H. rhodoterus*.

The upper region, from the end of the snout to the base of caudal is reddish brown, with irregular interspersed clouded purplish spots. The side of head and abdomen are silvery. The fins are yellowish; a cloudlike purplish spot at the anterior portion of anal. The posterior half of ventral is of a deep purple.

*Obs.* The label accompanying this species was unfortunately lost, consequently its location we are not prepared to give.

33. *HOLCONOTUS MEGALOPS*, G.—This species, six inches and a half in total length, is the largest of its species, as far as observations go. The body is very much compressed and very deep upon its middle region, tapering rapidly from

the origin of anal backwards. The greatest depth measured under the anterior dorsal, is contained a little more than thrice and a half in the total length. The head forms a little less than the fourth of the whole length. The cephalic region is concave. Mouth rather above the medium size, its cleft being obliquely directed upwards; the teeth are very exiguous; the posterior extremity of upper maxillary does not extend beyond the vertical line of the anterior rim of orbit, owing to the oblique position of mouth. The eye is very large and circular; its diameter being contained less than three times in the length of side of the head. The anal is very long and low posteriorly. The caudal is forked. The origin of ventrals is under the second spine of the anterior dorsal.

D IX. 27. A III. 32. C 4. 1. 6. 6. 1. 3. VI. 5. P 1-26.

The scales are of medium size, and on the middle of flanks they are higher than long, and subrounded.

Dorsal region and head above, ash colored or greyish brown; dorsal and caudal greyish. Sides of abdomen and belly dull yellow or white, with a silvery reflection. Pectorals yellowish. Base of ventrals yellowish; tip blackish or deep purple. Anal yellowish at base with tips of rays greyish, and a diffused spot upon its anterior third.

From Presidio, Cal.

#### Genus PHANERODON, Girard.

Mouth rather small; jaws very protractile; teeth large and subconical. Lips not very fleshy; lower one attached to the symphysis of the jaw. Anterior part of dorsal fin gradually rising from the first to the last spine, which, however, is a little shorter than the first articulated ray. Anal very low but quite long, furnished with bifurcated rays.

This genus is allied to *Embiotoca* by the presence of one row of teeth only upon both the upper and lower jaws, and by the lower lip in not being free all around. The structure of the dorsal reminds us of *Amphistichus*, whilst the shape of the anal is strongly suggestive of *Holconotus*.

34. PHANERODON FURCATUS, G.—Body very flat, seven inches in total length, tapering more or less rapidly backwards from the origin of both the soft dorsal and anal. The greatest depth of body, measured above the insertion of ventrals, is contained a little less than three times in the total length, in which the head enters about four times and a half. The cleft of the mouth does not extend to the anterior rim of the orbit. The eye is large and circular, and its diameter comprised three times and a half in the length of side of the head. The insertion of ventrals is opposite the fourth dorsal spine. The base of anal is nearly equal to that of soft dorsal and lower than the latter, its spiny rays are very small. The caudal is slender and deeply forked.

D X. 23. A III. 33. C 4. 1. 6. 6. 1. 3. VI. 5. P 1-19.

The scales are large and provided anteriorly with numerous grooves.

Color yellowish brown above, lighter on the sides; whitish under the throat. Fins yellowish. Margin of dorsal and caudal greyish. A diffused marginal spot upon the anterior portion of anal.

From Presidio, Cal.

35. AMPHISTICHUS ARGENTEUS, Agass. Amer. Jour. of Sc. Second series, xvii. 1854, p. 367.

From Presidio, Cal.

#### CYPRINIDÆ.

36. POGONICHTHYS ARGYREIOSUS, G.—This species is allied to *P. inaequilobus*; it is, however, distinct from the latter by the structure of the caudal which is equilobed like that of *P. symmetricus*. The head is contained five times in the total length, which, in the specimen before us, is about three inches and three quarters. The eye is large, subelliptical, and its horizontal diameter contained a little over three times in the length of the side of head. The body is compressed, regularly fusiform in its outline. The insertion of ventrals is situated some-



what behind the anterior margin of the dorsal. The pectorals and ventrals are rather small.

D I. 9. A II. 8. C 6. 1. 9. 8. 1. 5. V I. 9. P 16.

The scales are well developed; the lateral line is conspicuous and slightly bent downwards upon the abdomen.

The upper regions are rufous brown; the sides and belly shining silvery. Minute blackish dots are scattered all over, more densely on the dorsal region. A double series of these spots may be traced along the course of the lateral line. Dorsal and caudal fins greyish yellow; pectorals, ventrals and anal light yellow.

From Presidio, Cal.

37. *FUNDULUS PARVIFINNIS*, G.—Greatest length of specimen observed, three inches and one third; head contained in it a little more than four times. The body is compressed, the back slightly arched anteriorly to the dorsal fin. Greatest depth a little less than the fifth of the length. Eyes subelliptical, their horizontal diameter contained four times in the length of side of head: once in advance of the anterior rim of the orbit. Anterior margin of dorsal equidistant between tip of snout and posterior margin of caudal, which is subconvex. The origin of anal is opposite the middle of base of dorsal. All the fins are of small dimensions.

D II. 11. A 11. C 5. 1. 9. 8. 1. 4. V 5. P 16.

Scales rather large; twelve longitudinal rows may be counted on the line of greatest depth of body.

Ground color greenish yellow; upper part of head, back and sides blackish, resulting from the accumulation of minute dots upon the scales, less crowded on the flanks. Belly and inferior surface of head, unicolor, yellowish. A black stripe exists upon the middle of the flanks, from the anterior third of body to the base of caudal fin.

From San Diego, Cal.

#### GADIDÆ.

38. *GADUS PROXIMUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 141.

From Presidio, Cal.

#### CLUPEIDÆ.

39. *CLUPEA MIRABILIS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 138.

An immature specimen, a few inches in length, the label of which was mis-carried.

40. *MELETTA CERULEA*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 138.

From Presidio, Cal.

41. *ENGRAULIS MORDAX*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 138.

From San Diego, Cal.

42. *ENGRAULIS DELICATISSIMUS*, G.—The fascies of this species is widely different from that of either *E. encrasicolus* or *E. mordax*: the body being more compressed, less tapering, and the head much shorter and less acute. The entire length of the largest specimen before us is about three inches, the head being comprised in it nearly five times and a half. The greatest depth of body is a little less than the length of head, the upper surface of which is convex and but slightly declive. The eye is large and circular, and its diameter contained twice and three fourths of a time in the length of the side of head. The origin of dorsal is nearer the end of snout than to the extremity of caudal fin. The latter is forked. The base of anal is almost twice as long as that of dorsal, and its anterior margin situated opposite the middle region of the latter. The ventrals are small and short; the pectorals long and slender.

D 14. A 24. C 7. 1. 8. 8. 1. 6. V 5. P 12.

The few scales left scattered all over the body are very large.

Ground color yellowish; a silvery band, about a tenth of an inch, or slightly more, in width, occupies the middle of the flanks from head to base of caudal.

From San Diego, Cal.

## SALMONIDÆ.

43. *ARGENTINA PRETIOSA*, G.—The body is gracefully elongated, compressed, fusiform in its outline, six inches and one-third in total length, in which the head enters for a little less than the fifth. The eye is large and circular, and its horizontal diameter is contained a little over four times in the length of side of head. The posterior extremity of upper maxillary extends to a vertical line which would pass in advance of the pupil. The origin of dorsal fin is a little nearer the tip of lower jaw than to the base of caudal fin. The adipose is situated opposite the posterior fourth of anal. The caudal is forked. The origin of ventrals is placed a little behind the vertical line of anterior margin of dorsal; the fins are well developed. The pectorals are a little more slender and longer than the ventrals.

D 11. A 13. C 10. 1. 9. 8. 1. 8. V 8. P 1-16.

Scales of medium size. Upper region of head and back yellowish; outlines of scales marked by minute blackish dots. Sides of head and middle of flanks silvery, shining; lower part of flanks and belly dull yellowish.

From Presidio, Cal.

## PLEURONECTIDÆ.

41. *PLEURONECTES MACULOSUS*, G.—Body elongated, subelliptical; dorsal and ventral outline forming most regular curves into which the head immerses anteriorly with but a very slight depression above the eyes. The peduncle of the tail is slightly contracted immediately behind the posterior margin of both the dorsal and anal fins, which terminate evenly. From this point to the base of caudal fin, the caudal region assume a dove tail shape. The caudal fin itself is undulated posteriorly, the external and central rays being slightly longer than the intermediate ones. The total length of the fish is about seven inches and a half, in which length the head enters four times and one third. The lower jaw is the longest. The posterior extremity of upper maxillary reaches a vertical line which would pass behind the posterior rim of the orbit. The eyes, placed on the right side, are of medium size, elliptical, and their horizontal diameter is contained about five times and a half in the length of the side of head. The origin of dorsal is opposite the anterior rim of the orbit; that of the anal is in advance of the base of pectorals, as also the insertion of the ventrals, which are short and broad.

D 68. A 52. C 3. 1. 7. 6. 1. 2. V 6. P 1-10.

Scales quite small, extending over the head and opercular apparatus. Anterior arch of lateral line representing the section of a cupola in miniature.

Ground color reddish brown, with numerous scattered spots of a much deeper hue.

From San Diego, Cal.

45. *PLATICHTHYS RUGOSUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p 139.

Out of five immature specimens, two have the eyes situated on the right side, otherwise similar in every respect to those in which these organs are placed upon the left.

From Presidio, Cal.

46. *PAROPHRYS VETULUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 140.

From Presidio, Cal.

47. *PSETTICHTHYS SORDIDUS*, Grd. Proc. Acad. Nat. Sc. Philad. vii. 1854, p. 142.

Specimens, smaller than those formerly described, exhibit upon their body and fins irregular small black spots, in addition to the color elsewhere alluded to.

From Presidio, Cal.

## DISCOBOLI.

48. *LEPADOGASTER RETICULATUS*, G.—Head broad, semielliptical when viewed from above; upper surface declive towards the sides, as well as towards anterior extremity. It forms nearly the third of the entire length, which, in the specimen described, is about three inches and a half. Its inferior surface is flattened.

The mouth is broad in front, but not deeply cleft; its angle extending to the vertical of the anterior rim of the eye. The latter is small, subelliptical in shape, and situated near the upper surface of head; its horizontal diameter is contained about six times in the length of the side of head. The body is anteriorly broader than deep; it diminishes gradually in both height and depth towards the origin of the tail, which is quite compressed and very much reduced, and terminated by a slender caudal fin, rounded upon its posterior margin. The origin of the dorsal fin is situated a little in advance of the anus, but does not unite with the caudal, between which and the posterior extremity of its base, a space of three tenths of an inch is left; even the tips of its posterior rays do not reach the base of the caudal. The anal begins a little further back than the dorsal, is as deep as the latter is high, and extends likewise a little further behind; the tips of its posterior rays nearly reaching the base of the caudal. The pectorals are broad but short, the ventrals are imbedded in the membranous disk peculiar to that group of fishes.

D 14. A 13. C 3. 1. 5. 4. 1. 3. V 8. P 20 + 3.

The three inferior rays of pectorals are the stoutest, and situated under the throat, connected with the disk, which is very large. The surface of the anterior portion of the said disk exhibits large pavement-like cells.

The ground color is greenish brown, with a mesh work of black lines all over the head and body. The inferior surface of head and belly are dull yellow.

From San Luis Obispo, Cal.

### LOPHOBANCHII.

49. *SYNGNATHUS BREVIROSTRIS*, G.—Greatest length six inches and a half; head forming about the eighth of it. Snout abbreviated, distance from anterior rim of eye to tip of snout, equal to remaining portion of head. Dorsal fin quite low, and thirteen twentieths of an inch long. Posterior margin of same fin nearly equidistant between tip of snout and extremity of caudal. Pectorals small. No anal fin. Abdominal pouch, for the reception of the eggs after their laying, very long. Caudal of medium size and rounded.

D 30. C 1. 4. 4. 1. P 12.

Ground color greenish, tessellated with brown.

From San Diego, Cal.

50. *SYNGNATHUS LEPTORHYNCHUS*, G.—Entire length six inches; head contained in it six times and a half. Snout elongated and slender. Dorsal fin very low, and six tenths of an inch long; its posterior margin nearer the extremity of caudal fin than to the tip of the snout. Pectorals small. A rudimentary anal. Caudal slender and rounded posteriorly.

D 32. A 1. C 1. 4. 4. 1. P 10.

Dorsal region greenish yellow; sides bluish; abdomen whitish. Tail beneath dull yellow.

San Diego, Cal.



*Notice of a new genus of Cyprinidæ.*

By S. F. BAIRD AND CHARLES GIRARD.

**COCHLOGNATHUS, B. & G.**—The jaws are armed with a spoon-shaped plate, the edge of which is sharp and cutting. Pharyngeal teeth disposed upon one single row. The general appearance of the fish is cyprinoid, and strongly suggestive of *Pimephales*, the head having a rather robust appearance with a blunt snout. The mouth itself is rather small. There are no barbles or rudimentary barbles of any kind. The insertion of the ventral fins is situated opposite the anterior margin of the dorsal. The caudal is emarginate. The scales are very large. The lateral line is conspicuous, running through the middle of the flanks, slightly bent downwards upon the abdomen.

**COCHLOGNATHUS ORNATUS, B. & G.**—Head forming two ninths of the entire length, and abruptly rounded off on the snout. Mouth proportionately small and terminal with oblique cleft. Eyes rather above the medium size; their diameter being contained four times in the length of the side of head. Body much compressed, covered with large scales disposed in twelve longitudinal rows on the line of greatest depth. Lateral line inflexed downwards upon the abdomen. Anterior margin of dorsal nearly equidistant between the snout and rudimentary rays of the caudal. Anal, situated entirely backwards of the dorsal. Caudal forked. Insertion of ventrals beneath the anterior margin of dorsal; tip of pectoral not reaching them.

D 1. 8. A 6. C 4. I. 9. 8. 1. 3. V 8. P 12.

The colors, as preserved in alcohol, present a reddish brown ground, and a dark lateral band or stripe. The dorsal fin exhibits two elongated dark spots, one anteriorly and basal, the other posteriorly and nearer to its tip. The posterior half of the caudal has likewise a darker hue than its anterior and basal half, which is of a dull orange, as is also its extreme margin.

Brownsville, Texas; collected by Capt. Van Vliet.







